

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN DIEGO REGION**

**INTERNAL MEMO**

**Date:** March 27, 2003

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Executive Officer

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**Subject:** ALISO CREEK WATERSHED DIRECTIVE FOR BACTERIA  
MONITORING

**I. INTRODUCTION**

This memo is meant to provide an update on monitoring activities directed by the Regional Board in the Aliso Creek watershed and to obtain direction for future monitoring programs.

On March 2, 2001 the Executive Officer issued a Directive pursuant to CWC Section 13225 for an investigation of urban runoff in the Aliso Creek watershed. This Directive was issued in response to data showing urban runoff as a source of bacteria impairment and because implementation of the proposed countywide Drainage Area Management Plan would be inadequate to correct the impairment. This Directive required the County of Orange and the Cities within the watershed to conduct weekly monitoring at the largest storm drain outfalls that discharge to Aliso Creek. The Regional Board affirmed the issuance of the Directive in May 2001, requiring additional monitoring locations, including the County's suggestion for receiving water locations upstream and downstream of the outfalls.

The Directive monitoring has been conducted weekly since April 2001 at 39 storm drain outfalls and has demonstrated that bacteria levels in exceedance of water quality objectives is ubiquitous. At this point, the Regional Board faces several issues concerning continued urban runoff bacteria monitoring by the cities and County within the Aliso Creek watershed.

- Weekly bacteria monitoring at storm drain outfalls and receiving water locations has been conducted for nearly two years, resulting in approximately 100 samples per monitoring location. The criteria established by the Regional Board for terminating monitoring at specific locations, however, will likely not be met at more than two locations in the near future.

- A total maximum daily load (TMDL) allocation is being developed for Aliso Creek as part of a regionwide bacteria TMDL effort, and the monitoring data will be used to calculate pollutant load allocations.
- The copermittees have submitted urban runoff management plans in accordance with the third-term municipal storm water NPDES permit, Regional Board Order No. R9-2002-01. These plans were required to detail management measures, including monitoring, for addressing bacteria in the Aliso Creek watershed. The Regional Board will need to assess whether these plans are commensurate with the expectations of the Directive.
- Reductions in the monitoring program may be appropriate to allow copermittees to direct resources toward developing and implementing best management practices.
- Based upon results of the monitoring program and the development of new urban runoff management plans, changes in the monitoring program are warranted to evaluate BMP implementation.

## II. RECOMMENDATIONS

The following recommendations are based upon reviews of seven quarterly reports submitted per the monitoring Directive, preliminary reviews of urban runoff Local Implementation Plans (LIPs) submitted per Regional Board Order No. R9-2002-01, and discussions with copermittees.

1. The monitoring program should address the needs of TMDL contractor, Tetra Tech, in acquiring data for use in TMDL development for the Aliso Creek watershed.
2. The intent of continued monitoring should be clarified, and changes in the monitoring program that promote assessment of BMP implementation and identification of pollution sources should also be considered. The current monitoring has only achieved one of the two goals established by the directive: quantification of bacteria. General bacteria counts at most outfalls and receiving water locations appear to follow a consistent seasonal pattern, suggesting baseline conditions of bacteria levels have been determined. At this time, however, most of the data is not being acted upon because copermittees are concentrating activities within their limited number of “priority drains” (see Table 1).
3. The Regional Board should identify program criteria for allowing changes to the monitoring program. For copermittees whose proposals meet that program criteria, the monitoring could change from compliance-based to measurements of program effectiveness. Copermittees whose program commitments fail to meet such criteria would continue compliance-based monitoring. This approach would focus monitoring efforts in drainage areas that receive enhanced BMP implementation as required by the Receiving Waters Limitation requirements in the Orange County Municipal Storm Water Permit, Regional Board Order No. R9-2002-01. Changes to monitoring design based upon program commitments would provide the Northern Watershed Protection Unit additional flexibility in addressing the bacteria problem within each municipality.

4. If management measures proposed by the copermitees are inadequate to identify and eliminate sources of bacteria, the Regional Board may provide guidance to individual copermitees for achieving those objectives.

The following provides the rationale for the above recommendations.

### III. PURPOSE AND RESULTS OF MONITORING

As stated in the March 2, 2001 Directive, the Directive's purpose was to evaluate the relative contribution of urban runoff discharges to beneficial use impairment or water quality exceedances and to take appropriate measures to eliminate the sources of pollution. Weekly monitoring was meant to identify major contributing sources of bacteria and to evaluate the effectiveness of control measures. At the May 9, 2001 Regional Board meeting, the Board stated it would consider the termination of monitoring at any specific location if data demonstrated compliance with contact recreation (REC-1) standards for three consecutive months at that specific location.

To date, no monitoring location has met that criteria. Rather than identifying limited sources of elevated bacteria concentrations, the monitoring data has demonstrated that nearly every storm drain contributes to exceedances of water quality objectives. Table 2 shows how often REC-1 conditions have been met at the storm drains and at the downstream monitoring locations.

The current monitoring program has been used by cities to prioritize drainage areas for implementing control measures. Although several copermitees have implemented or have plans to implement BMPs as a result of action plans in those priority areas, the outfall monitoring data is not useful for describing BMP effectiveness.

Monitoring Locations: Storm drain outfalls 39 inches in diameter and larger are monitored weekly, as are the receiving waters 25 feet upstream and downstream of the outfalls. Up to 39 outfalls are monitored depending on flow. Thirty five (35) outfalls have consistently had flowing conditions. In addition, data is reported for receiving water locations in the lowermost watershed at the Coastal Treatment Plant, near Pacific Coast Highway, and the surfzone (see Figure 1).

#### General Conclusions from Monitoring:

- REC-1 is rarely being met in the receiving waters or storm drains. REC-2 is met more often, though not consistently in the inland receiving waters and rarely in discharges from stormdrains.
- Streamflow can either dilute or increase concentrations in receiving waters downstream of storm drain outfalls depending on the relative discharge and bacteria concentrations.
- Every reach of urbanized Aliso Creek gains bacteria from storm drains without a compensating assimilation effect from the natural creek processes. Each storm drain, therefore, could result in downstream exceedances.

- The lower open space Aliso Creek stations within Aliso/Woods Canyon Park (Coastal Treatment Plant and confluence of Woods Canyon) generally have lower bacteria counts than the urbanized receiving waters.
- Bacteria concentrations at the mouth and in the surfzone are heavily influenced by storm-associated discharges of bacteria. That is, bacteria levels markedly increase at those locations following storm events.
- There appears to be seasonal trends with the data, where warm seasons exhibit higher bacteria counts. Contributing factors may include increased bacteria survival or propagation during warm months and increases in bacteria inputs, such as fertilizer application/lawn watering, dog walking, and wildlife activity in warm months.

Suspected Sources of Bacteria: Cities have performed local reconnaissance within priority drainage areas and have conducted follow-up inspections. The following sources and contributing factors have been identified:

**Suspected Sources**

- Pets
- Wildlife (within and outside of MS4)
- Organic fertilizers
- Commercial trash bins
- Construction site runoff
- Spills from restaurant sewer laterals associated with malfunctioning grease interceptors/traps
- Spills from sewers, laterals, or stormflow infiltration
- Anywhere w/in MS4 where bacteria settles, propagates and awaits being flushed out

**Suspected Contributing Factors**

- Irrigation runoff transports bacteria to streams and provides nutrients (organic matter) and habitat (water and sediment) in channels.
- Pooled water within MS4 system (e.g., on roads, in pipes, any grade breaks) may provide localized areas of refuge and propagation.
- Underground stormdrains may provide corridors and living space for urban wildlife.

Limitations of Current Monitoring: Continued outfall monitoring is not useful for all locations at this stage. The monitoring program has quantified bacteria and has identified major contributing stormdrains, but is not able to detect changes resulting from BMP actions other than end-of-pipe activities. It is not effective for evaluation and assessment of small scale BMPs within the contributing areas because of dilution from other nuisance sources within that particular drainage area. As a result, the monitoring design is skewed to conclude that only end-of-pipe or in-stream BMPs will result in a change in water quality data.

The current data is being used for trend monitoring and not investigative monitoring. For instance, the copermittees are not acting on data spikes, but are developing plans based upon a quarterly review of the data. At this point most of the monitoring is not being acted upon because copermittees are concentrating BMP activities within their selected “priority drains.”

#### IV. TMDL DEVELOPMENT

The Directive monitoring data is being used by the TMDL contractor, Tetra Tech, to develop bacteria TMDLs for impaired water segments in the region, including Aliso Creek. This data is being used to calibrate models and to assign pollutant load allocations. A Public Workshop and CEQA Scoping Meeting for Bacteria Impaired Waters TMDLs is scheduled for March 27, 2003. Tetra Tech may identify additional data needs for TMDL development.

#### V. COPERMITTEE ACTIONS and MUNICIPAL STORM WATER PERMIT REQUIREMENTS

In response to data documenting widespread impairment, staff directed each City with a monitored outfall to develop an “action plan” for identifying and abating sources at problem drains beginning with highest priority. In the seven quarterly progress reports the copermittees have reported various source identification and illicit discharge detection activities, mostly based on reconnaissance and inspections, that have been conducted in priority drainage areas. Suspected sources of bacteria identified by the copermittees include those from residential, commercial, and construction areas. Irrigation runoff has been identified as a primary delivery mechanism for several suspected sources.

Cities have implemented various BMPs, including education, enforcement, new regulations, and structural treatment methods. There has been minimal testing of the effectiveness of management measures, however, other than by stormdrain outfall testing. The outfall monitoring data is not useful for describing BMP effectiveness. BMP effectiveness is more adequately measured close to BMP implementation because monitoring of outfall data loses precision as other flows are commingled.

Concurrent with implementation of the action plans, the copermittees were developing urban runoff local implementation plans (LIPs) to comply with the third-term MS4 permit, Regional Board Order No. R9-2002-01. This permit requires each city to conduct dry-weather monitoring and to require source control measures. Pursuant to language of the MS4 permit, copermittees in the Aliso Creek watershed were also required to identify measures and control actions to reduce bacteria loadings from storm drains to receiving waters in the Aliso Creek watershed. The Regional Board will need to assess whether these plans are commensurate with the expectations of the Directive. The LIPs are currently being reviewed for compliance with Regional Board Order No. R9-2002-01 and to see if they adequately address the bacteria problem in the Aliso Creek watershed.

The following is a brief summary of planned actions in the urban runoff Local Implementation Plans (LIPs) regarding bacteria reduction in the Aliso Creek watershed. The copermittees have been invited to attend the April 2003 Regional Board meeting and will be able to clarify intentions.

## Aliso Creek

Aliso Viejo. The City of Aliso Viejo has created a plan to prioritize and investigate storm drain drainage areas. The City would investigate a pair of drains for six months so that by July 2004, eight of fourteen major storm drains within the city will have been investigated. Investigations would include monitoring within the drainage area to identify “hot spots” and subsequently targeting source identification and elimination activities in those areas.

Laguna Beach. A small portion of the Aliso Creek watershed is located within the City of Laguna Beach near the mouth of the creek. The City’s LIP does not identify specific measures for the portions of the city within the Aliso Creek watershed.

Laguna Hills. The City of Laguna Hills has identified some program activities for three priority subwatersheds of Aliso Creek. Planned actions include additional water quality testing, in cooperation with the City of Laguna Niguel, and assessment of catch basin inserts that are designed to treat bacteria. In addition, the City has committed to quarterly cleaning of catch basins in those priority areas.

Laguna Niguel. The City of Laguna Niguel has committed to several source identification and BMP implementation activities in the Aliso Creek watershed. The City has identified four subwatersheds that will receive the highest priority for municipal, commercial and residential BMP implementation, inspection, and effectiveness activities. For instance, the City has a plan to test the effectiveness of catch basin inserts, street sweeping, and constructed treatment wetlands. In addition, the LIP describes a commitment for inspecting certain high priority commercial activities within all the City’s Aliso Creek tributaries. The City states it will focus on nurseries and restaurants in first two years, auto and gas facilities in the third year, and all other high priority commercial activities in year four.

Laguna Woods. The City of Laguna Woods includes the Leisure World community. Aliso Creek bisects Leisure World, but none of the monitored storm drains lie within Leisure World or Laguna Woods. The City’s plans in the Aliso Creek watershed include education and discussions with Leisure World.

Lake Forest. The City of Lake Forest has proposed visual reconnaissance and coordination with sewer agencies as activities to identify and eliminate sources of bacteria. The City has selected two Aliso Creek priority drainage areas, and the LIP does not identify specific commitments beyond reconnaissance for those drainage areas and does not identify BMP implementation or additional source identification activities for these drainage areas that are above and beyond the general LIP program components.

Mission Viejo. The City of Mission Viejo has identified three priority Aliso Creek subwatersheds and has described plans in the LIP for those areas. The City considers all residential areas in the Aliso Creek watershed to be high priority areas and has committed to inspecting all high and medium priority commercial areas in the watershed during the first 18 months of program implementation.

County of Orange (and County of Orange Flood Control District). The County of Orange has jurisdiction over open space park areas and the urbanizing headwaters of the Aliso Creek

## Aliso Creek

watershed. The County plans to continue coordination of monitoring and reporting efforts and to develop water quality enhancement projects for the creek areas.

## VII. CONCLUSION

The Northern Watershed Protection Unit will continue to evaluate the quarterly progress reports submitted per the monitoring Directive and will continue to provide guidance to the Aliso Creek copermittees during quarterly meetings. In addition, we will complete our reviews of the urban runoff Local Implementation Plans (LIPs) submitted per Regional Board Order No. R9-2002-01. Following our review, we plan to discuss Aliso Creek issues with the copermittees in the context of the LIPs.

A status report on the progress of the MS4 permittees in the Aliso Creek watershed is on the April 9, 2003 Regional Board agenda. Our intent is to discuss the current monitoring and reporting program. We will be prepared to discuss the monitoring results and responses from the copermittees. We have requested that the copermittees be present at the Regional Board meeting to answer questions from the Board.

**Table 1. Municipalities Within Monitoring Point Drainage Areas.**

<b>Storm Drain</b>	<b>Municipalities Within Monitoring Point Drainage Areas</b> AV = Aliso Viejo CO = County of Orange LH = Laguna Hills LN = Laguna Niguel LW = Laguna Woods LF = Lake Forest MV = Mission Viejo *Asterisk denotes priority storm drain as selected by one or more city.
J01P08*	CO, LF
J01TBN8	CO, LF
J01P06	CO, LF
J01TBN2	LF
J07P02*	MV
J07P01*	MV
J01P01*	LF
J01TBN3	MV, LF
J01P32	LF
J01P05	LF
J01P03*	MV
J01P04	MV
J06	AV, LH, LF, LW,
J05	MV, LH
J01P30	AV
J01P28*	AV
J01P27	AV
J01TBN4	AV
J01P33	AV
J01P26	AV
J01P25	LN
J01P24	AV, LN
J01P23	AV
J03TBN1*	LN
J03TBN2	LN
J03P01*	LN
J03P05*	LN
J03P13	LN
J04*	AV, LH, LN
J03P02*	LN
J01P22	AV
J01P21	AV
J02P08	AV, CO
J02TBN1*	AV, CO
J02P05*	AV, CO



**Table 2. Number of months during first 20 months that monitoring locations met REC-1 objectives.**

\*Asterisk denotes priority storm drain as selected by one or more city.

<b>Location</b>	<b>Months Storm Drain Outfall met REC-1</b>	<b>Months Receiving Water Downstream of Outfall met REC-1</b>	<b>Months Receiving Water Upstream of Outfall met REC-1</b>
J01P08*	0/20	0/20	2/20 (10%)
J01TBN8	0/20	0/4	0/4
J01P06	1/20 (5%)	0/11	0/11
J01TBN2	0/20	0/5	0/1
J07P02*	0/20	0/20	insufficient flows or data
J07P01 *	0/20	0/20	1/20 (5%)
J01P01 *	1/20 (5%)	0/20	4/20 (20%)
J01TBN3	0/20	1/20 (5%)	0/20
J01P32	0/17	0/20	0/20
J01P05	0/20	1/20 (5%)	0/20
J01P03*	0/20	0/20	0/20
J01P04	0/20	0/20	0/20
J06	0/20	1/20 (5%)	1/20 (5%)
J05	1/20 (5%)	1/20 (5%)	1/20 (5%)
J01P30	0/20	1/20 (5%)	2/20 (10%)
J01P28*	0/20	0/20	1/20 (5%)
J01P27	0/20	0/20	0/20
J01TBN4	0/20	0/20	0/20
J01P33	0/19	0/19	0/19
J01TBN7	0/13	insufficient flows or data	insufficient flows or data
J01P26	0/19	0/19	0/19
J01P25	1/19 (5%)	0/19	0/19
J01P24	5/19 (26%)	0/19	0/19
J01P23	0/19	0/19	0/19
J03TBN1*	0/17	3/17 (18%)	3/17 (18%)
J03TBN2	0/17	1/17 (6%)	3/17 (18%)
J03P01 *	0/20	0/20	3/20 (15%)
J03P05*	0/20	0/20	0/20
J03P13	0/20	0/20	0/20
J04*	0/20	0/20	1/20 (5%)
J03P02*	0/20	0/20	0/20
J01P22	0/20	0/20	0/20
J01P21	6/19 (30%)	0/20	2/20 (10%)
J02P08	0/20	insufficient flows or data	insufficient flows or data
J02TBN1*	0/20	2/20 (10%)	5/20 (25%)
J02P05*	1/20 (5%)	0/20	5/20 (25%)
Sulphur Crk confluence	0/6	0/20	0/13 (19%)
Woods Cyn confluence	no data	3/15 (20%)	3/16
Coastal Trt Plant	2/16 (13%)	no data	no data

Aliso Creek

**Figure 1. Aliso Creek Watershed Monitoring Locations.**

(attached)